

## **REMARKS**

### **I. Introduction**

With the cancellation herein without prejudice of claims 78 to 80 and the addition of claim 96, claims 78 to 90 and 92 to 96 are pending in the present application. In view of the foregoing amendments and following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

### **II. Rejection of Claims 81 to 95 Under 35 U.S.C. § 112, Second Paragraph**

Claims 81 to 95 were rejected under 35 U.S.C. § 112, second paragraph as allegedly indefinite.

As regards claim 81, the Examiner will note that claim 81 has been amended herein without prejudice to correct a typographic error to change "individual silicon" to --individual silicon layer--. It is therefore respectfully submitted that claim 81 fully complies with the requirements of 35 U.S.C. § 112.

As regards claim 94, the Examiner will note that claim 94 has been amended herein without prejudice to delete the first instance of "carbon." It is therefore respectfully submitted that claim 94 fully complies with the requirements of 35 U.S.C. § 112.

In view of the foregoing, it is respectfully submitted that the present rejection has been obviated, and withdrawal of this rejection is respectfully requested.

### **III. Rejection of Claims 81 to 90 and 92 to 95 Under 35 U.S.C. § 102(b)**

Claims 81 to 90 and 92 to 95 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,619,865 ("Keem et al."). Applicants respectfully submit that Keem et al. do not anticipate the present claims for the following reasons.

Amended claim 81 relates to a multilayer structure. Amended claim 81 recites alternating first and second layers, the first layer including an individual hard-material layer and the second layer including an individual carbon layer or an individual silicon, wherein: the hard-material layers include a metal carbide, a metal silicide, a metal carbosilicide, a metal siliconitride, a metal carbide-containing carbon, or a metal silicide-containing silicon, and a mixture of at least two of the

metal carbide, the metal silicide, the metal carbo-silicide, the metal siliconitride, the metal carbide-containing carbon, and the metal silicide-containing silicon, and the metal includes chromium or niobium.

The Office Action alleges that Keem et al. anticipate claims 81 to 90 and 92 to 95 by allegedly providing alternating layers with “claim materials” and the “claimed thickness.” The Office Action alleges that Keem et al. disclose using metal chromium as a ductile layer and silicon or carbon for an oxidation resistant layer.

Keem et al. are limited to providing the following combinations of elements for production of “hard” layers: titanium and boron; titanium and carbon; tungsten and boron; molybdenum and boron; carbon; aluminum and oxygen; silicon and nitrogen; boron and nitrogen; tungsten and carbon; tantalum and carbon; titanium and nitrogen; zirconium and oxygen; and combinations of such materials. Col. 2, lines 58 to 68. Keem et al. do not disclose or suggest hard-material layers including a metal carbide, a metal silicide, a metal carbo-silicide, a metal siliconitride, a metal carbide-containing carbon, or a metal silicide-containing silicon, and a mixture of at least two of a metal carbide, a metal silicide, a metal carbo-silicide, a metal siliconitride, a metal carbide-containing carbon, and a metal silicide-containing silicon, and that a metal includes chromium or niobium. As a result, Keem et al. do not disclose, or even suggest, the features of amended claim 81.

To anticipate a claim, each and every element as set forth in the claim must be found in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, “[t]he identical invention must be shown in as complete detail as is contained in the . . . claim.” Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). That is, the prior art must describe the elements arranged as required by the claims. In re Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). As more fully set forth above, it is respectfully submitted that Keem et al. do not disclose, or even suggest, all of the limitations of amended claim 81. It is therefore respectfully submitted that Keem et al. do not anticipate claim 81.

As for claims 82 to 90 and 92 to 95, which ultimately depend from claim 81 and therefore include all of the limitations of claim 81, it is respectfully submitted that Keem et al. do not anticipate these dependent claims for at least the same reasons given above in support of the patentability of claim 81.

#### **IV. Rejection of Claims 81 to 90 and 92 to 94 Under 35 U.S.C. § 102(b)**

Claims 81 to 90 and 92 to 94 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,216,539 ("Boher et al.") or U.S. Patent No. 4,727,000 ("Ovshinsky et al."). Applicants respectfully submit that neither Boher et al. nor Ovshinsky et al. anticipates the present claims for the following reasons.

Boher et al. allegedly provide a device which will function as a mirror for a range of light wavelengths, including X and UV rays. The device includes a lower layer of first heavy element and an upper spacer layer of a lighter element. In Table 1, line 11, Boher et al. provide a chromium layer over a carbon layer. Boher et al. also provide a Rh/Cr/C layer system Table II, line 24. Boher et al. furthermore provide the following material layer combinations: Cr/C; Cr/Li/C, B/Cr/C; Al/Cr/C; Si/Cr/C; Ti/Cr/C; Mn/Cr/C; Fe/Cr/C; Co/Cr/C; Ni/Cr/C; Cu/Cr/C; Zn/Cr/C; Ge/Cr/C; As/Cr/C; Sr/Cr/C; Y/Cr/C; Zr/Cr/C; Nb/Cr/C; Mo/Cr/C; Pd/Cr/C; Ag, Cr, C; Cr/Ba/C; Hf/Cr/C; Ta/Cr/C; W/Cr/C; Re/Cr/C; Os/Cr/C; Ir/Cr/C; Pt/Cr/C and Au/Cr/C in Table III. Boher et al. fail to disclose or suggest hard-material layers including a metal carbide, a metal silicide, a metal carbo-silicide, a metal siliconitride, a metal carbide-containing carbon, or a metal silicide-containing silicon, and a mixture of at least two of the metal carbide, the metal silicide, the metal carbo-silicide, the metal siliconitride, the metal carbide-containing carbon, and the metal silicide-containing silicon, and the metal includes chromium or niobium.

Ovshinsky et al. allegedly relate to X-ray dispersive and reflective structures. Ovshinsky et al. provide layer pairs as described in Tables 5A and 5B. In Table 5B, a layer pair of chromium-carbon is provided. Ovshinsky et al., however, do not disclose or suggest hard-material layers including a metal carbide, a metal silicide, a metal carbo-silicide, a metal siliconitride, a metal carbide-containing carbon, or a metal silicide-containing silicon, and a mixture of at least two of the metal carbide, the metal silicide, the metal carbo-silicide, the metal siliconitride, the metal carbide-containing carbon, and the metal silicide-containing silicon, and the metal includes chromium or niobium.

In view of the foregoing, it is respectfully submitted that neither Boher et al. nor Ovshinsky et al. anticipates claim 81 as amended herein.

As for claims 82 to 90 and 92 to 94, which ultimately depend from claim 81 and therefore include all of the features of claim 81, it is respectfully submitted that neither Boher et al. nor Ovshinsky et al. anticipates these dependent

claims for at least the same reasons given above in support of the patentability of claim 81.

**V. Rejection of Claims 81, 82, 84 to 90, 92 and 94 Under 35 U.S.C. § 102(b)**

Claims 81, 82, 84 to 90, 92 and 94 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,785,470 ("Wood et al."). Applicants respectfully submit that Wood et al. do not anticipate the present claims for the following reasons.

Wood et al. allegedly relate to reflectivity and resolution x-ray dispersive and reflective structures for carbon, beryllium and boron analysis. The Office Action refers to the Abstract of Wood et al. to allege that alternating layers of Cr:C, Ni:C or V:C are used for carbon analysis. Applicants respectfully submit that Wood et al. do not disclose or suggest hard-material layers including a metal carbide, a metal silicide, a metal carbo-silicide, a metal siliconitride, a metal carbide-containing carbon, or a metal silicide-containing silicon, and a mixture of at least two of the metal carbide, the metal silicide, the metal carbo-silicide, the metal siliconitride, the metal carbide-containing carbon, and the metal silicide-containing silicon, and the metal includes chromium or niobium. It is therefore respectfully submitted that Wood et al. do not anticipate amended claim 81.

As for claims 82 to 90 and 92 to 94, which ultimately depend from claim 81 and therefore include all of the features of claim 81, it is respectfully submitted that Wood et al. do not anticipate these dependent claims for at least the same reasons given above in support of the patentability of claim 81.

**VI. Rejection of Claims 81, 82, 84 to 90, 92, 94 and 95 Under 35 U.S.C. § 102(e)**

Claims 81, 82, 84 to 90, 92, 94 and 95 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 5,593,719 ("Dearnaley et al."). Applicants respectfully submit that Dearnaley et al. do not anticipate the present claims for the following reasons.

Dearnaley et al. allegedly relate to treatments to reduce frictional wear between components made of ultra-high molecular weight polyethylene and metal alloys. Dearnaley et al. provide a metal-silicon-diamond like structure for reduction of frictional wear. Col. 4, line 66 to Col. 5, line 6. Metal substrates include cobalt,

nickel, titanium, zirconium, chromium, molybdenum, tungsten, platinum and palladium. Col. 5, lines 13 to 16. Applicants respectfully submit that Dearnaley et al. do not disclose or suggest hard-material layers including a metal carbide, a metal silicide, a metal carbo-silicide, a metal siliconitride, a metal carbide-containing carbon, or a metal silicide-containing silicon, and a mixture of at least two of the metal carbide, the metal silicide, the metal carbo-silicide, the metal siliconitride, the metal carbide-containing carbon, and the metal silicide-containing silicon, and the metal includes chromium or niobium. Dearnaley et al. are silent regarding any metal carbides, metal silicides metal carbo-silicides, metal siliconitrides, metal carbide-containing carbons or metal silicide-containing silicon wherein the metal includes chromium or niobium. It is therefore respectfully submitted that Dearnaley et al. do not anticipate claim 81.

As for claims 82 to 90 and 92 to 94, which ultimately depend from claim 81 and therefore include all of the features of claim 81, it is respectfully submitted that Dearnaley et al. do not anticipate these dependent claims for at least the same reasons given above in support of the patentability of claim 81.

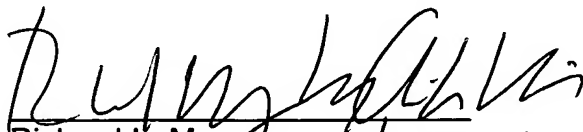
## VII. Conclusion

It is therefore respectfully submitted that all pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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